SECTION 07512 - BUILT-UP COAL-TAR ROOFING

PART 1 - GENERAL

1.1 SUMMARY (Not Applicable)

1.2 DEFINITIONS

A. Bitumen: A generic term for either asphalt or coal-tar pitch.

B. Hot Coal-Tar Pitch: Coal-tar pitch heated to its equiviscous temperature, the temperature at which its viscosity is 25 centipoise for either mopping or mechanical application, within a range of plus or minus 25 deg F (14 deg C), measured at the mop cart or mechanical spreader immediately before application.

C. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoise for mopping application and 75 centipoise for mechanical application, within a range of plus or minus 25 deg F (14 deg C), measured at the mop cart or mechanical spreader immediately before application.

1.3 SUBMITTALS

A. Product Data: For each product indicated.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other Work.

C. Samples: For each product included in membrane roofing system.

D. Research/evaluation reports.

E. Maintenance data.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer, approved by manufacturer to install manufacturer's products.

B. Source Limitations: Obtain components for roofing system from or approved by roofing system manufacturer.

C. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Exterior Fire-Test Exposure: Class A B C ; ASTM E 108, for application and roof slopes indicated.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form, without monetary limitation, in which manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within 20 years from date of Substantial Completion. Failure includes roof leaks.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Built-up Coal-Tar Roofing:

a. Hickman, W. P. Systems Inc.
b. Honeywell Commercial Roofing Systems.
c. Koppers Industries.

2.2 BASE-SHEET MATERIALS

A. Sheathing Paper: Red-rosin type, minimum 3 lb/100 sq. ft. (0.16 kg/sq. m).

B. Base Sheet: ASTM D 4601, Type II, nonperforated, asphalt-impregnated and -coated, glass-fiber sheet, dusted with fine mineral surfacing on both sides.

C. Base Sheet: ASTM D 4897, Type II, venting, nonperforated, heavyweight, asphalt-impregnated and -coated, glass-fiber base sheet with coarse granular surfacing or embossed venting channels on bottom surface.

2.3 ROOFING MEMBRANE PLIES

A. Ply Sheet: ASTM D 227, coal-tar-saturated organic felt.

B. Ply Sheet: ASTM D 4990, Type I, coal-tar-impregnated, glass-fiber felt and the physical properties of ASTM D 2178, Type IV VI .

2.4 FLASHING MATERIALS

A. Backer Sheet: ASTM D 2178, Type IV, asphalt-impregnated, glass-fiber felt.

B. Backer Sheet: Roofing system manufacturer's standard spun-bonded, nonwoven, polyester-reinforced fabric, of standard color and weight, suitable for application method specified.

C. Flashing Sheet: ASTM D 6164, Type I or II, polyester-reinforced, SBS-modified asphalt sheet; granular surfaced; suitable for application method specified and as follows:

1. Granule Color: White Gray Tan .

D. Flashing Sheet: ASTM D 6162, Type I or II, composite polyester- and glass-fiber-reinforced, SBS-modified asphalt sheet; granular surfaced; suitable for application method specified and as follows:

1. Granule Color: White Gray Tan .

E. Flashing Sheet: ASTM D 6163, Type I or II, glass-fiber-reinforced, SBS-modified asphalt sheet; granular surfaced; suitable for application method specified and as follows:

1. Granule Color: White Gray Tan .

2.5 BITUMEN MATERIALS

A. Asphalt Primer: ASTM D 41.

B. Coal-Tar Primer: ASTM D 43.

C. Coal-Tar Pitch: ASTM D 450, Type I.

D. Roofing Asphalt: ASTM D 312, Type III IV III or IV as recommended by built-up roofing system manufacturer for application .

2.6 AUXILIARY ROOFING MEMBRANE MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with built-up roofing.

B. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required by roofing system manufacturer for application.

C. Coal-Tar Roofing Cement: ASTM D 5643, coal-tar-based roofing cement, asbestos free.

D. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FM 4470; designed for fastening roofing membrane components to substrate; tested by manufacturer for required pullout strength; and acceptable to roofing system manufacturer.

E. Aggregate Surfacing: ASTM D 1863, No. 6 or No. 67, clean, dry, opaque, water-worn gravel or crushed stone, free of sharp edges crushed slag, free of sharp edges .

F. Walkway Pads: Mineral-granule-surfaced, reinforced asphaltic composition or Polymer-modified, reconstituted solid-rubber, surface-textured , slip-resisting pads, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, 3/8 inch (9 mm) or 1/2 inch (13 mm) or 3/4 inch (19 mm) thick, minimum.

2.7 SUBSTRATE BOARDS

A. Substrate Board: ASTM C 36, Type X gypsum wall board, 5/8 inch (16 mm) thick.

B. Substrate Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/4 inch (6 mm) or 1/2 inch (13 mm) or Type X, 5/8 inch (16 mm) thick.

C. Substrate Board: ASTM C 728, perlite board, 3/4 inch (19 mm) or 1 inch (25 mm) thick, seal coated.

D. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening substrate panel to roof deck.

2.8 ROOF INSULATION

A. Extruded-Polystyrene Board Insulation: ASTM C 578, Type IV, 1.6-lb/cu. ft. (26-kg/cu. m) X, 1.3-lb/cu. ft. (21-kg/cu. m) minimum density, square edged.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, felt or glass-fiber mat facer on both major surfaces.

C. Composite Polyisocyanurate Board Insulation: ASTM C 1289, faced with insulation board on one major surface, as indicated below by type, and felt or glass-fiber mat facer on the other.

1. Type III (perlite-insulation-board facer), 1/2 inch (13 mm) or 3/4 inch (19 mm) thick.
2. Type IV (cellulosic-fiber-insulation-board facer), Grade 1, 1/2 inch (13 mm) thick.

D. Perlite Board Insulation: ASTM C 728; composed of expanded perlite, cellulosic fibers, binders, and waterproofing agents with top surface seal-coated.

E. Cellulosic-Fiber Board Insulation: ASTM C 208, Type II, Grade 1, fibrous-felted wood fiber or other cellulosic-fiber and water-resistant binders, asphalt impregnated, chemically treated for deterioration.

F. Glass-Fiber-Board Insulation: ASTM C 726, combining glass fibers with thermosetting resin binders, faced on one side with asphalt-coated fiberglass scrim and kraft paper.

G. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope of 1/8 inch per 12 inches (1:96) or 1/4 inch per 12 inches (1:48), unless otherwise indicated.

H. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.

2.9 INSULATION ACCESSORIES

A. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and acceptable to roofing system manufacturer.

B. Cold Fluid-Applied Adhesive: Manufacturer's standard cold fluid-applied adhesive formulated to adhere roof insulation to substrate.

C. Insulation Cant Strips: ASTM C 728, perlite insulation board.

D. Insulation Cant Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

E. Tapered Edge Strips: ASTM C 728, perlite insulation board.

F. Tapered Edge Strips: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board.

G. Tapered Edge Strips: ASTM C 726, glass-fiber insulation board.

H. Cover Board: ASTM C 208, Type II, Grade 1, cellulosic-fiber insulation board, 1/2 inch (13 mm) thick.

I. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, 1/4 inch (6 mm) or 1/2 inch (13 mm) thick.

PART 3 - EXECUTION

3.1 SUBSTRATE BOARD INSTALLATION

A. Install substrate board with long joints in continuous straight lines, perpendicular to roof slopes with end joints staggered between rows. Tightly butt substrate boards together.

1. Fasten substrate board to top flanges of steel deck according to roofing system manufacturer's written instructions.

3.2 INSULATION INSTALLATION

A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system manufacturer's written instructions for installing roof insulation.

C. Nailer Strips: Mechanically fasten 4-inch nominal- (89-mm actual-) width wood nailer strips of same thickness as insulation perpendicular to sloped roof deck, spaced 16 feet (4.88 m) <Insert spacing> apart for roof slopes greater than 1/8 inch per 12 inches (1:96) or 1/4 inch per 12 inches (1:48) or 1/2 inch per 12 inches (1:24) .

D. Install tapered insulation under area of roofing to conform to slopes indicated.

E. Install one or more layers of insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 1-1/2 inches (38 mm) or 2 inches (50 mm) or greater, install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

F. Adhered Insulation: Install each layer of insulation and adhere to substrate as follows:

1. Prime surface of concrete deck with asphalt or coal-tar primer at a rate of 3/4 gal./100 sq. ft. (0.3 L/sq. m) and allow primer to dry.
2. Set each layer of insulation in a solid mopping of hot roofing asphalt or coal-tar pitch .
3. Set each layer of insulation in a cold fluid-applied adhesive.

G. Mechanically Fastened Insulation: Install each layer of insulation and secure to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

H. Mechanically Fastened and Adhered Insulation: Install each layer of insulation and secure first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

1. Install subsequent layers of insulation in a solid mopping of hot roofing asphalt or coal-tar pitch .
2. Install subsequent layers of insulation in a cold fluid-applied adhesive.

I. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Loosely butt cover boards together and fasten to roof deck.

3.3 ROOFING MEMBRANE INSTALLATION

A. Install built-up roofing membrane system according to roofing system manufacturer's written instructions and applicable recommendations of ARMA/NRCA's "Quality Control Guidelines for the Application of Built-up Roofing."

B. Where roof slope exceeds 1/8 inch per 12 inches (1:96) or 1/4 inch per 12 inches (1:48) or 1/2 inch per 12 inches (1:24) , install sheets of built-up roofing membrane parallel with slope and backnail.

C. Coordinate installing roofing system components so insulation and roofing membrane sheets are not exposed to precipitation or left exposed at the end of the workday or when rain is forecast.

D. Substrate-Joint Penetrations: Prevent coal-tar pitch or roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

E. Loosely lay one course of sheathing paper, lapping edges and ends a minimum of 2 inches (50 mm) and 6 inches (150 mm), respectively.

F. Install one lapped course of base sheet, extending sheet over and terminating beyond cants. Attach base sheet as follows:

1. Mechanically fasten to substrate.
2. Spot- or strip-mop to substrate with hot roofing asphalt.
3. Adhere to substrate in a solid mopping of hot roofing asphalt.

G. Install two or three or four ply sheets starting at low point of roofing system. Align ply sheets without stretching. Shingle side laps of ply sheets uniformly to achieve required number of plies throughout thickness of roofing membrane. Shingle in direction to shed water. Extend ply sheets over and terminate beyond cants.

1. Embed each ply sheet in a solid mopping of hot coal-tar pitch.

H. Composite Roofing Membrane: Install one lapped coal-tar, glass-fiber felt ply sheet course over shingled organic felt ply sheets according to roofing system manufacturer's written instructions, starting at low point of roofing system. Offset laps from laps of preceding ply sheets and align ply sheet without stretching. Lap in direction to shed

water. Embed ply sheet in a solid mopping of hot coal-tar pitch applied at rate required by roofing system manufacturer. Extend ply sheet over and terminate beyond cants.

I. Aggregate Surfacing: Promptly after installing and testing roofing membrane, base flashing, and stripping, flood-coat roof surface with 70 lb/100 sq. ft. (3.5 kg/sq. m) of hot coal-tar pitch. While flood coat is hot and fluid, cast the following average weight of aggregate in a uniform course:

1. Aggregate Weight: 400 lb/100 sq. ft. (20 kg/sq. m) or 300 lb/100 sq. ft. (15 kg/sq. m) .

J. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.

1. Sweep away loose aggregate surfacing and set walkway pads in additional flood coat of hot coal tar.

3.4 FLASHING AND STRIPPING INSTALLATION

A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions.

B. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.

D. Install stripping, according to roofing system manufacturer's written instructions, where metal flanges and edgings are set on built-up roofing.

END OF SECTION 07512